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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/557,527	11/21/2005	Hajrudin Ceric	2003P00701WOUS	2004

22116 7590 08/03/2009  
SIEMENS CORPORATION  
INTELLECTUAL PROPERTY DEPARTMENT  
170 WOOD AVENUE SOUTH  
ISELIN, NJ 08830

EXAMINER
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VERDIER, CHRISTOPHER M

ART UNIT	PAPER NUMBER
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3745

MAIL DATE	DELIVERY MODE
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08/03/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/557,527	<b>Applicant(s)</b> CERIC ET AL.	
	<b>Examiner</b> Christopher Verdier	<b>Art Unit</b> 3745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 29 April 2009 and 03 December 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 11-17 and 19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 11-17 and 19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 January 2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

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Applicant's Amendment dated December 3, 2008, and Applicant's arguments dated December 3, 2008 and April 29, 2009 have been carefully considered but are non-persuasive.

Concerning German Patent 3,926,556, Applicant has argued that this patent does not disclose "the first piston element configured to effect movement of the rotor by transfer of the first force ... [and] the second piston element configured to effect movement of the rotor by transfer of the second force ... ". This argument is not persuasive, because the first piston element 28 effects movement of the rotor 2 by transfer of the first force and the second piston 28 element (on the right side of figure 1) effects movement of the rotor by transfer of the second force. Concerning Applicant's arguments that German Patent 3,926,556 does not disclose using a piston to effect movement of the rotor by transfer of a hydraulic force with operation of the first or second of the forces through the first or second piston element alternately causing displacement of the rotor along the first and second direction from a first operating position into a second operating position, does not disclose piston chambers in the first element are hydraulically connected to piston chambers in the second element through a control valve selectively connecting the first flow path to the second flow path, and does not disclose a control valve selectively connecting the first flow path to the second flow path so that when the first piston element effects movement of the rotor, hydraulic fluid is displaced from one or more chambers of the second element toward the hydraulic system, and does not disclose that each piston is operatively positioned in a different piston chamber to effect one of the first or second forces, operation of the first or second forces through the first or second piston element causing displacement of the rotor along the first or second direction from a first operating position into a

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second operating position, German Patent 2,357,881 teaches these features as set forth later below.

Concerning Applicant's argument that German Patent 3,926,556 does not disclose "at least one restrictor ... positioned between the first piston element and the hydraulic system and at least one second restrictor ... positioned between the second piston element and the hydraulic system.", this argument is not persuasive, because there are restrictors on 40 on both the left and right hand sides of the shaft bearing assembly.

Applicant's arguments concerning the Tardy reference are that none of the prior art of record provides two restrictors in combination with connecting the first flow path to the second flow path so that when the first piston element effects movement of the rotor, hydraulic fluid is displaced from one or more chambers of the second element toward the hydraulic system. These arguments are not persuasive, because German Patent 3,926,556 discloses restrictors 40 on both the left and right hand sides of the shaft bearing assembly, and Tardy is not relied upon to teach the feature of restrictors. As set forth above, German Patent 2,357,881 teaches connecting the first flow path to the second flow path so that when the first piston element effects movement of the rotor, hydraulic fluid is displaced from one or more chambers of the second element toward the hydraulic system.

Concerning claim 12, Applicant has argued that none of the prior art provides, in addition to the restrictors of claim 11, a first flow control valve positioned between the first piston

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element and the hydraulic system and a second flow control valve positioned between the second piston element and the hydraulic system, and that Applicant's restrictors and flow control valves are configured so that the restrictors only limit displacement speed of the rotor in the event of a fault whereas the flow control valves limit admissible displacement speed of the rotor during intended displacement. These arguments are not persuasive, because Tardy teaches that a piston (unnumbered, inside cylinder 3) may have a restrictor 5/7 formed with a flow control valve 4, for the purpose of controlling flow to the piston. Forming the shaft bearing assembly of German Patent 3,926,556 such that each restrictor includes a flow control valve, such that a first flow control valve is positioned between the first piston element and the hydraulic system and a second flow control valve is positioned between the second piston element and the hydraulic system are duplications of a known part for a known function, as set forth in the previous Office action.

With regard to claim 19, Applicant has argued that while Arvidsson 4,915,510 discloses bearings that move like pistons, these are controlled by a servo valve in contact with the axle so that pressure in the cylinders is adjusted in response to changes in position of the axle. However, as set forth in the previous Office action, the use of 4/2-way directional control valves are well-known in the art of hydraulic systems, for the purpose of providing communication between two fluid motors, and it would have been further obvious at the time the invention was made to a person having ordinary skill in the art to form the modified bearing body of Arvidsson such that the directional control valve is a 4/2-way directional control valve, for the purpose of providing communication between the two fluid pistons.

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### ***Claim Objections***

Claim 14 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form. All limitations in claim 14 are contained in claim 11, from which claim 14 depends.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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Claims 11 and 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over German Patent 39 26 556 in view of German Patent 2,357,881. Disclosed is a shaft bearing assembly 10 for axially mounting a rotor 2 and for selective movement of the rotor along a thrust axis of the rotor, comprising a bearing body 12/14 having first and second opposing track sides (the left and right sides), the first track side positionable along the axis and adjacent a first stop surface (near 20) on the rotor to transfer a first force in a first direction along the thrust axis, the second track side positionable along the axis and adjacent a second stop surface (analogous to 20 on the right side of the rotor) on the rotor to transfer a second force in a second direction along the thrust axis, the second direction being opposite the first direction, a first hydraulic piston element 28 positioned in the bearing body to exert the first force in the first direction and against the first stop surface, the first piston element configured to effect movement of the rotor by transfer of the first force to shoe 18, a second hydraulic piston element 28 positionable in the bearing body to exert the second force in the second direction and against the second stop surface (note that pistons are provided on both the left and right sides), the second piston element configured to effect movement of the rotor by transfer of the second force to shoe 118, the first and second elements each comprising a plurality of hydraulic pistons, each piston operatively positioned in a different piston chamber 32 to effect one of the first or second forces, operation of the first or second forces through the first or second piston elements alternately causing displacement of the rotor along the first and second direction from a first operating position into a second operating position, a hydraulic system (not shown) connected to generate the first and second forces with hydraulic fluid acting on the pistons of the first and second elements, the hydraulic system including a first flowpath extending to pistons in the first element and a second

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flow path extending to pistons in the second element, wherein to limit displacement speed of the rotor, restrictors 40 are positioned between the first piston element and the hydraulic system and restrictors 40 are positioned between the second piston element and the hydraulic system.

Noting the ninth paragraph of the partial English translation of DE 3,926,556, a source of oil pressure is provided. The third to last paragraph indicates that there are shoes 118 on the opposite side of surface 8 with corresponding piston cylinder units 16 which contain corresponding pistons 28. It is clear that the hydraulic fluid from the source of oil pressure is connected to generate the first and second forces with hydraulic fluid acting on the pistons of the first and second elements, and includes a first flow path extending to pistons in the first element and a second flow path extending to pistons in the second element, since there must be two flowpaths to each of the pistons in the first and second elements for the assembly to operate. Further, the third to last paragraph indicates that there is a first hydraulic piston element which exerts the first force in the first direction and a second hydraulic piston element to exert the second force in the second direction. The piston chambers are fluidically connected to one another via ring channel 44. Each hydraulic piston element is of annular design. The recitation in claim 11, lines 1-2 of “for axially mounting a rotor of a gas turbine” is a recitation of intended use. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.



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However, German Patent 39 26 556 does not disclose that the hydraulic system includes a hydraulic pump connected to generate the first and second forces with the pump causing hydraulic fluid to act on the pistons of the first and second elements (claim 11), and does not disclose one or more piston chambers in the first element are hydraulically connected to one or more piston chambers in the second element through a control valve selectively connecting the first flow path to the second flow path so that when the first piston element effects movement of the rotor, hydraulic fluid is displaced from one or more chambers of the second element toward the hydraulic system (claim 11).

German Patent 2,357,881 shows an axial thrust bearing arrangement having pistons 7 located on opposite sides of a rotor 2. A hydraulic system includes a hydraulic pump (note the universal pump symbol driven by 19) connected to generate a first and a second force with the pump causing hydraulic fluid to act on the pistons of first and second elements, with a piston chamber 6 in the first element (the left side of the arrangement) hydraulically connected to a piston chamber 6 in the second element (the right side of the arrangement) through a control valve 13 selectively connecting the first flow path to the second flow path so that when the first piston element effects movement of the rotor, hydraulic fluid is displaced from one chamber of the second element toward the hydraulic system, for the purpose of providing movement and axial thrust balancing of the rotor.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to form the shaft bearing assembly of German Patent 39 26 556 such that

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the hydraulic system includes a hydraulic pump connected to generate the first and second forces with the pump causing hydraulic fluid to act on the pistons of the first and second elements, and with one of the piston chambers in the first element hydraulically connected to one of the piston chambers in the second element through a control valve selectively connecting the first flow path to the second flow path so that when the first piston element effects movement of the rotor, hydraulic fluid is displaced from one or more chambers of the second element toward the hydraulic system, as taught by German Patent 2,357,881, for the purpose of providing movement and axial thrust balancing of the rotor.

Claims 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over German Patent 39 26 556 and German Patent 2,357,881 as applied to claim 11 above, and further in view of Tardy 4,470,339. The modified German Patent 39 26 556 shows a shaft bearing assembly substantially as claimed as set forth above, including the feature that when the system is assembled on the rotor, the restrictors only limit the displacement speed of the rotor in the event of a fault, due to the structural similarity to Applicant's disclosed restrictor arrangement, but does not show a first flow control valve positioned between the first piston element and the hydraulic system and a second flow control valve positioned between the second piston element and the hydraulic system, with the flow control valves configured so that the flow control valves limit admissible displacement speed of the rotor during intended displacement (claim 12), and does not show that each restrictor is formed with a flow-control valve (claim 13).

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Tardy teaches that a piston (unnumbered, inside cylinder 3) may have a restrictor 5/7 formed with a flow control valve 4, for the purpose of controlling flow to the piston.

It would have been further obvious at the time the invention was made to a person having ordinary skill in the art to form the modified shaft bearing assembly of German Patent 39 26 556 such that it includes a first flow control valve positioned between the first piston element and the hydraulic system and a second flow control valve positioned between the second piston element and the hydraulic system, with the flow control valves configured so that the flow control valves limit admissible displacement speed of the rotor during intended displacement, with each restrictor being formed with a flow-control valve, as taught by Tardy, for the purpose of controlling flow to the pistons. Concerning the recitations of each restrictor being formed with a flow control valve, and the first flow control valve positioned between the first piston element and the hydraulic system and the second flow control valve positioned between the second piston element and the hydraulic system, these are duplications of a known part for a known function. It would have been obvious to provide each restrictor of the modified German Patent 39 26 556 with a flow control valve as a duplication of a known part for a known function, since it has been held that mere duplication of parts has no patentable significance unless a new and unexpected result is produced. *In re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960). Note that this modification inherently would result in the flow control valves limiting admissible displacement speed of the rotor during an intended displacement.

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Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Arvidsson 4,915,510 in view of German Patent 39 26 556 and Applicant's Admitted Prior Art. Arvidsson discloses a shaft bearing system for axially mounting a rotor 1 of a gas turbine, comprising a rotationally fixed bearing body 12, 13 that has first and second hydraulic piston arrangements 2, 3 formed separately from one another at opposing positions along the bearing body, each configured to transfer a hydraulic force for axially displacing the rotor in a different direction and between a first operating position and a second operating position, and a hydraulic system 4-9 fluidically connected by a fluid flow path through valve 8 to both of the hydraulic piston arrangements, to generate forces for displacing the rotor in each of the different directions.

However, Arvidsson does not disclose that to limit the displacement speed of the rotor, at least one restrictor is arranged in the fluid flow path between the hydraulic piston arrangement and the hydraulic system, and does not disclose that the directional control valve is a 4/2-way directional control valve to selectively operate the first and second piston arrangements to displace the rotor with hydraulic forces generated by the hydraulic system or fluidically connect the piston arrangements to limit displacement speed of the rotor.

German Patent 39 26 556 shows a bearing 10 for axially mounting a rotor 2 of a gas turbine, comprising a rotationally fixed bearing body 12/14 that has a hydraulic piston arrangement 16 for axially displacing the rotor from a first operating position into a second operating position, and a hydraulic system (unnumbered, connected at 44 to a source of oil pressure) fluidically connected to the hydraulic piston arrangement, wherein to limit the

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displacement speed of the rotor, restrictors 40 are arranged in a fluid flow path between the hydraulic piston arrangement and the hydraulic system.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to form the bearing body of Arvidsson with at least one restrictor is arranged in the fluid flow path between the hydraulic piston arrangement and the hydraulic system, as taught by German Patent 39 26 556, for the purpose of limiting the displacement speed of the rotor.

With regard to the recitation of the directional control valve being a 4/2-way directional control valve, Official Notice was taken in the first Office action that the use of 4/2-way directional control valves are well-known in the art of hydraulic systems, for the purpose of providing communication between two fluid motors (pistons). Applicant did not traverse the examiner's assertion of official notice. Pursuant to MPEP 2144.03, the common knowledge or well-known in the art statement is taken to be admitted prior art because applicant failed to traverse the examiner's assertion of official notice.

It would have been further obvious at the time the invention was made to a person having ordinary skill in the art to form the modified bearing body of Arvidsson such that the directional control valve is a 4/2-way directional control valve, valve to selectively operate the first and second piston arrangements to displace the rotor with hydraulic forces generated by the hydraulic system or fluidically connect the piston arrangements to limit displacement speed of

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the rotor, as taught by Applicant's Admitted Prior Art, for the purpose of providing communication between the two fluid pistons.

The recitation in claim 19, lines 1-2 of "for axially mounting a rotor of a gas turbine" is a recitation of intended use. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing use, then it meets the claim.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher Verdier whose telephone number is (571) 272-4824. The examiner can normally be reached on Monday-Friday from 10:00-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward K. Look can be reached on (571) 272-4820. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Christopher Verdier/  
Primary Examiner, Art Unit 3745

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